



Assignment Sheet / Density Test

Project Number : 23502-ZS9 Lab. Tech : K. Ford
Project Name : HSR Date Completed : 11/26/13
Date Drilled : 10/30/13 Boring : S0033AR

Notes:

CHEM	Sulfate/Chloride	MR	Minimum Resistivity
COLL	Collapse	PH	pH Test
CONSOL	1D Consolidation	PI	Atterberg Limits
CURV	Modified Proctor	RV	R-value
DD	Moisture Density	RVT	R-value Treated
DS	Direct Shear	SA	Sieve Analysis
HY	Hydrometer	TRX	Triaxial Compression

<u>MOISTURE & DENSITY TEST</u>							
Client : <u>URS/ARUP/HMM JV</u>		Project : <u>California High Speed Train</u>				ISI Lab No.: <u>G-52763</u> Job no : <u>2636-001.0</u>	
Boring #	S0033AR						
Sample #	SS08						
Depth (ft.)	23.5-24						
Soil type: (visual)	Brown sand						
1. Date tested:	11/15/13						
2. Tested by:	JH						
3. Specimen height (in.)							
4. Wt. of specimen + tare (gm)							
5. Tare wt. (gm)							
6. Diameter (in.)							
7. Wet wt. of soil + dish wt. (gm)	465.15						
8. Dry wt. of soil + dish wt. (gm)	430.50						
9. Wt. of dish (gm)	195.04						
10. Dish ID							
Wet Density (pcf)							
Dry Density (pcf)							
Moisture Content (%)	14.7						
Gs (Assumed)	2.70	2.70	2.70	2.70	2.70	2.70	2.70
Void Ratio							
Saturation (%)							
Additional data:							
Wt. of dry soil + dish before washing (gm)							
Wt. of dry soil + dish after washing (gm)							
% Passing # 200 sieve							
USCS symbol							

<u>MOISTURE & DENSITY TEST</u>								ISI Lab No.: G-52923
Client : URS/ARUP/HMM JV			Project : California High Speed Train					Job no : 2636-001.0
Boring #	S0029R	S0029R	S0030R	S0033AR	S0069AR	S0069AR	S0069AR	S0069R
Sample #	MC09-2	U10	MC10-3	SS16	U11	MC16-1	MC18-1	MC02-2
Depth (ft.)	41.0-41.5	42.0-44.5	42.0-42.5	50.0-51.5	42.0-44.5	65.0-66.5	75.0-76.5	5.5-6.0
Soil type: (visual)	Grayish brown silty clay	Olive brown sandy silt	Greenish gray clayey sand	Grayish brown silt with sand (BAGGIE COULD NOT DO MD)	Olive brown sandy clay	Olive gray sandy clay	Olive brown silty clay	Grayish green clay with sand
1. Date tested:	01/17/14	01/17/14	01/17/14	01/15/14	01/17/14	01/17/14	01/17/14	01/17/14
2. Tested by:	JH	JH	JH	JH	JH	JH	JH	JH
3. Specimen height (in.)	5.96	3.93	5.90		3.96	6.00	6.00	5.95
4. Wt. of specimen + tare (gm)	900.72	868.95	815.58		880.48	951.22	956.29	897.34
5. Tare wt. (gm)	0.00	0.00	0.00		0.00	0.00	0.00	0.00
6. Diameter (in.)	2.41	2.85	2.37		2.87	2.42	2.42	2.41
7. Wet wt. of soil + dish wt. (gm)	276.47	264.91	298.04	98.44	273.64	275.82	301.24	293.74
8. Dry wt. of soil + dish wt. (gm)	229.46	229.54	247.22	90.20	239.02	239.79	257.94	255.15
9. Wt. of dish (gm)	50.59	50.41	50.06	50.96	51.20	50.87	50.41	50.89
10. Dish ID								
Wet Density (pcf)	126.1	131.9	119.3		130.8	131.2	131.9	125.8
Dry Density (pcf)	99.9	110.2	94.8		110.5	110.2	109.1	105.8
Moisture Content (%)	26.3	19.7	25.8	21.0	18.4	19.1	20.9	18.9
Gs (Assumed)	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70
Void Ratio	0.687	0.529	0.777		0.525	0.529	0.544	0.592
Saturation (%)	103.3	100.7	89.6		94.8	97.3	103.6	86.2
Additional data:								
Wt. of dry soil + dish before washing (gm)								
Wt. of dry soil + dish after washing (gm)								
% Passing # 200 sieve								
USCS symbol								



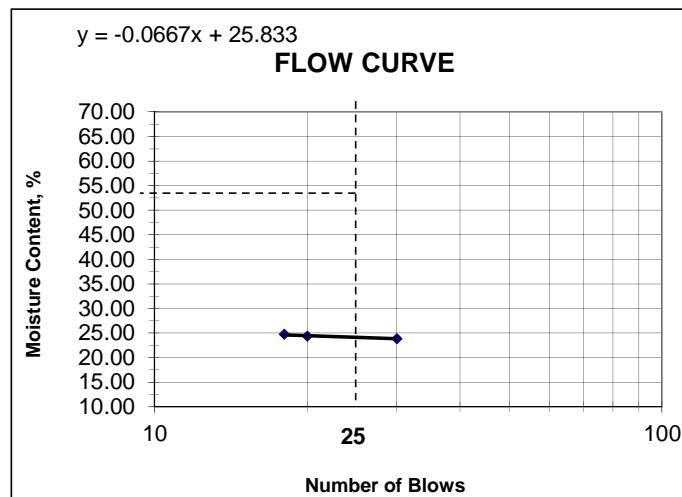
TECHNICON
ENGINEERING SERVICES, INC.
Determination of Atterberg Limits
ASTM D 4318, CTM 204

Project Name:	HSR	Boring No.:	S0033AR	Project No.:	23502-ZS9
Sample No:	MC15-1	Depth:	46-46.5'	Date:	11/22/133
Soil Classification:	CL			Tested By:	D.M.

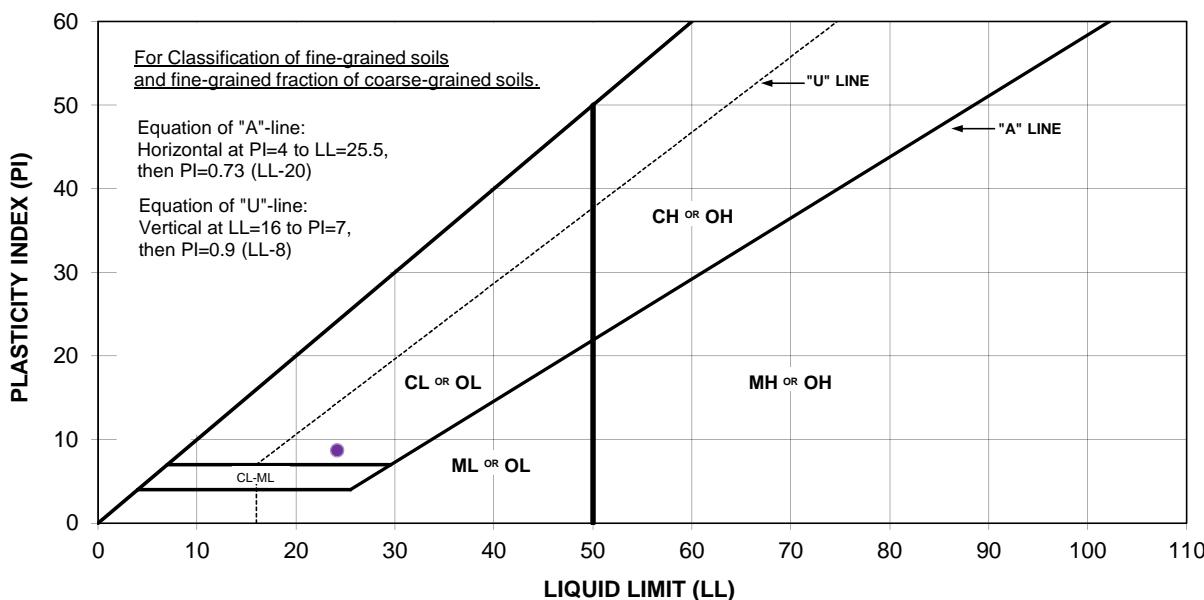
A Tes No.	PLASTIC LIMIT			LIQUID LIMIT			
	1	2	3	No. of Blows	20	30	18
	1	2	3		1	2	3
C Mass of Pan + Dry Soil, g	31.58	30.54	30.64		37.40	31.74	27.70
D Mass of Pan + Wet Soil, g	32.08	30.84	31.04		39.60	34.34	29.39
E Mass of Pan, g	28.34	28.40	28.28		28.37	20.84	20.87
F Mass of Water, g	0.50	0.30	0.40	0.00	2.20	2.60	1.69
G Mass of Dry Soil, g	3.24	2.14	2.36		9.03	10.90	6.83
H Moisture Content, %	15.43	14.02	16.95		24.36	23.85	24.74
I Average Moisture Content, % (PL)	15.47						

42.1795

Liquid Limit:	24.2
Plastic Limit: Line I	15.5
Plasticity Index: PI = LL - PL	8.7



ASTM D2487

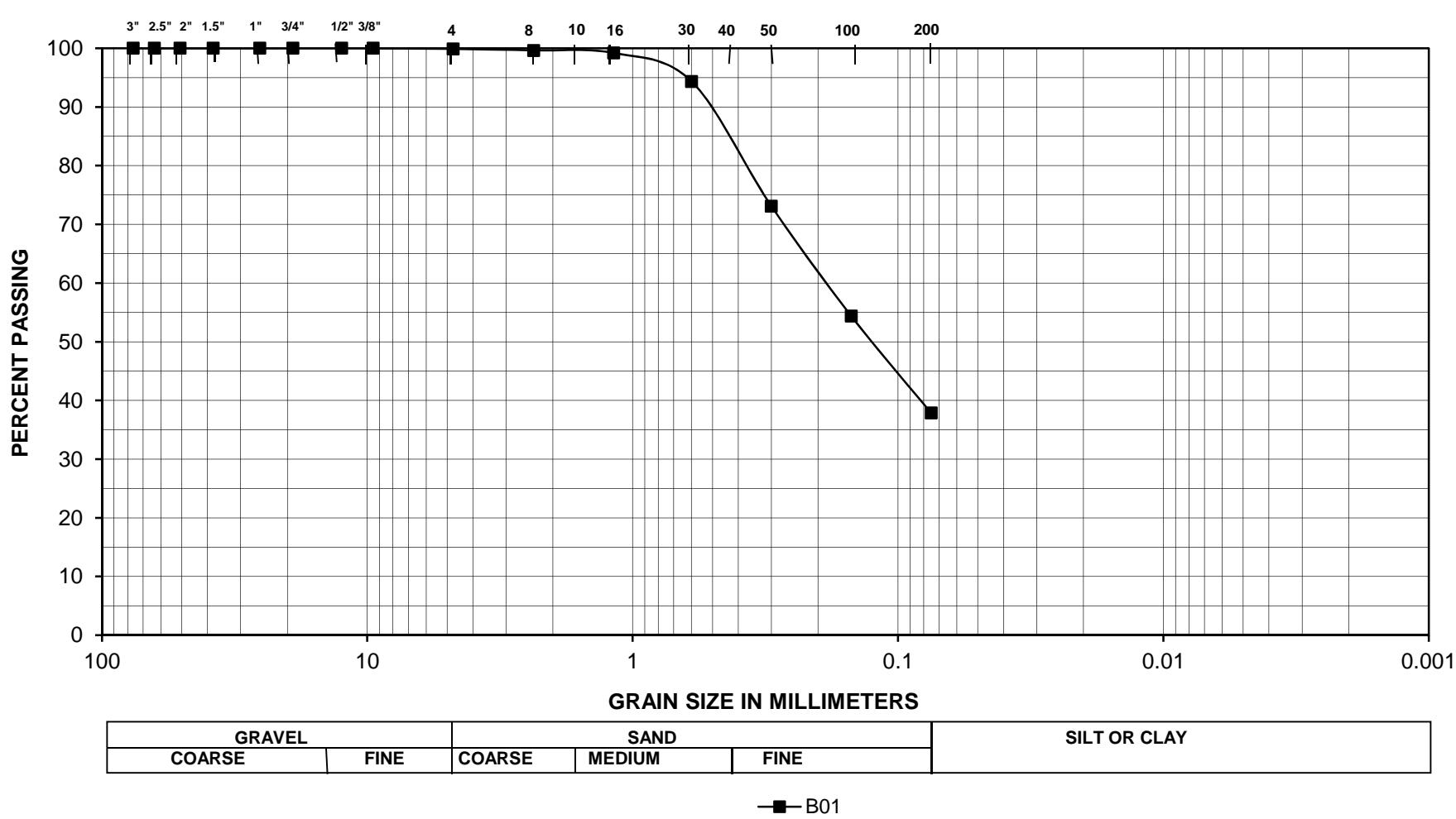




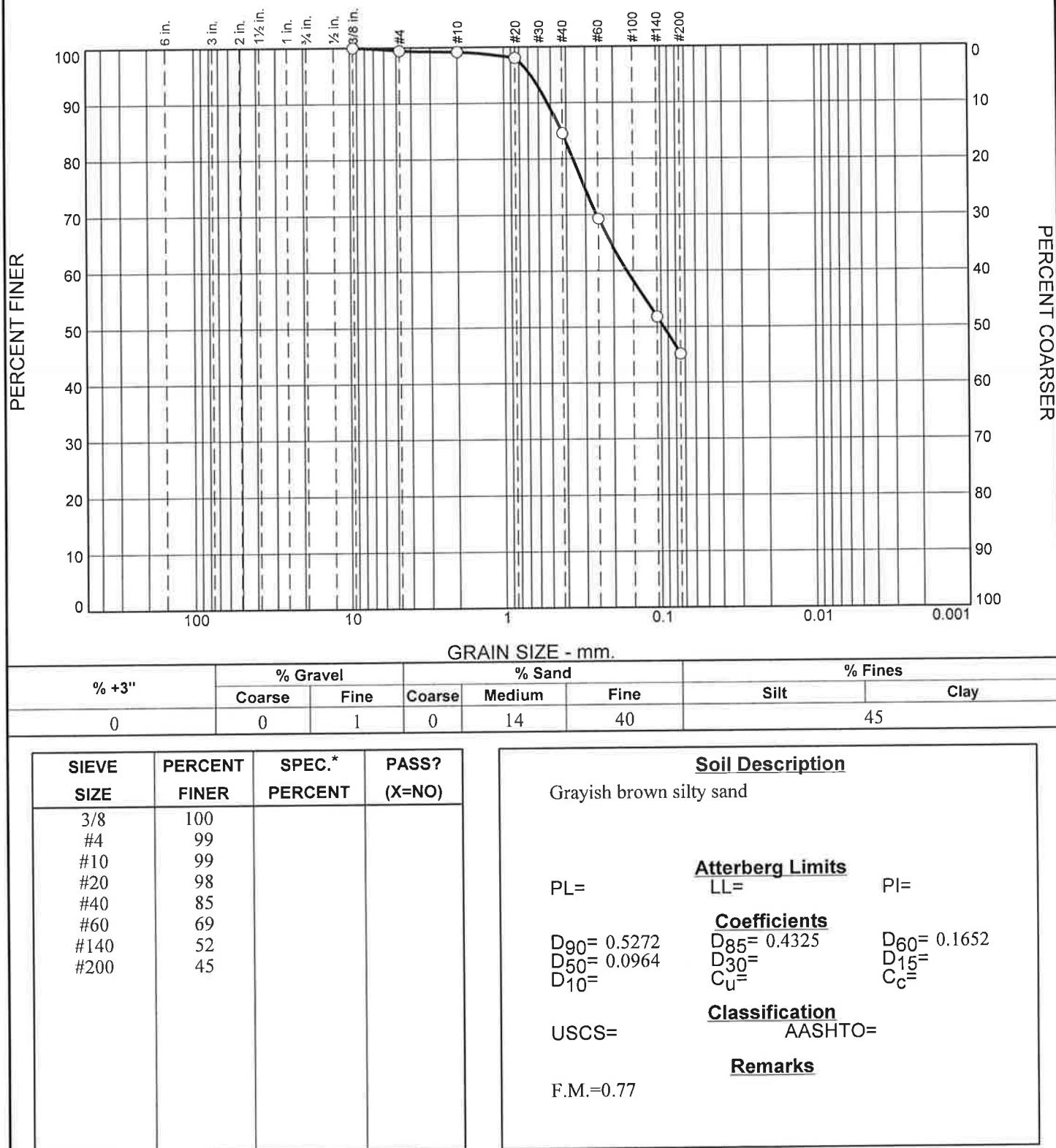
Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford		
TES#:	23502-ZS9	Date:	11/20/2013		
Boring #:	S0033AR; 0-5'	Sample No.:	B01		
		Classification:	(SM) Silty Sand		
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)		
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)		
Tare Weight		3/8"	2.0 (1.0)		
Total Dry Sample Wt.	189.6	1/2"	4.0 (2.0)		
Initial Weight Fine		3/4"	11.0 (5.0)		
Aggregate Before Wash	189.6	1"	22.0 (10.0)		
Final Weight Fine		1 1/2"	33.0 (15.0)		
Aggregate After Wash	120.6	2"	44.0 (20.0)		
Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.2	0.0	0.1	99.9	
#8	0.7	0.5	0.4	99.6	
#16	1.5	0.8	0.8	99.2	
#30	10.7	9.2	5.6	94.4	
#50	51.0	40.3	26.9	73.1	
#100	86.5	35.5	45.6	54.4	
#200	117.8	31.3	62.1	37.9	
Pan	120.6				



Particle Size Distribution Report



* (no specification provided)

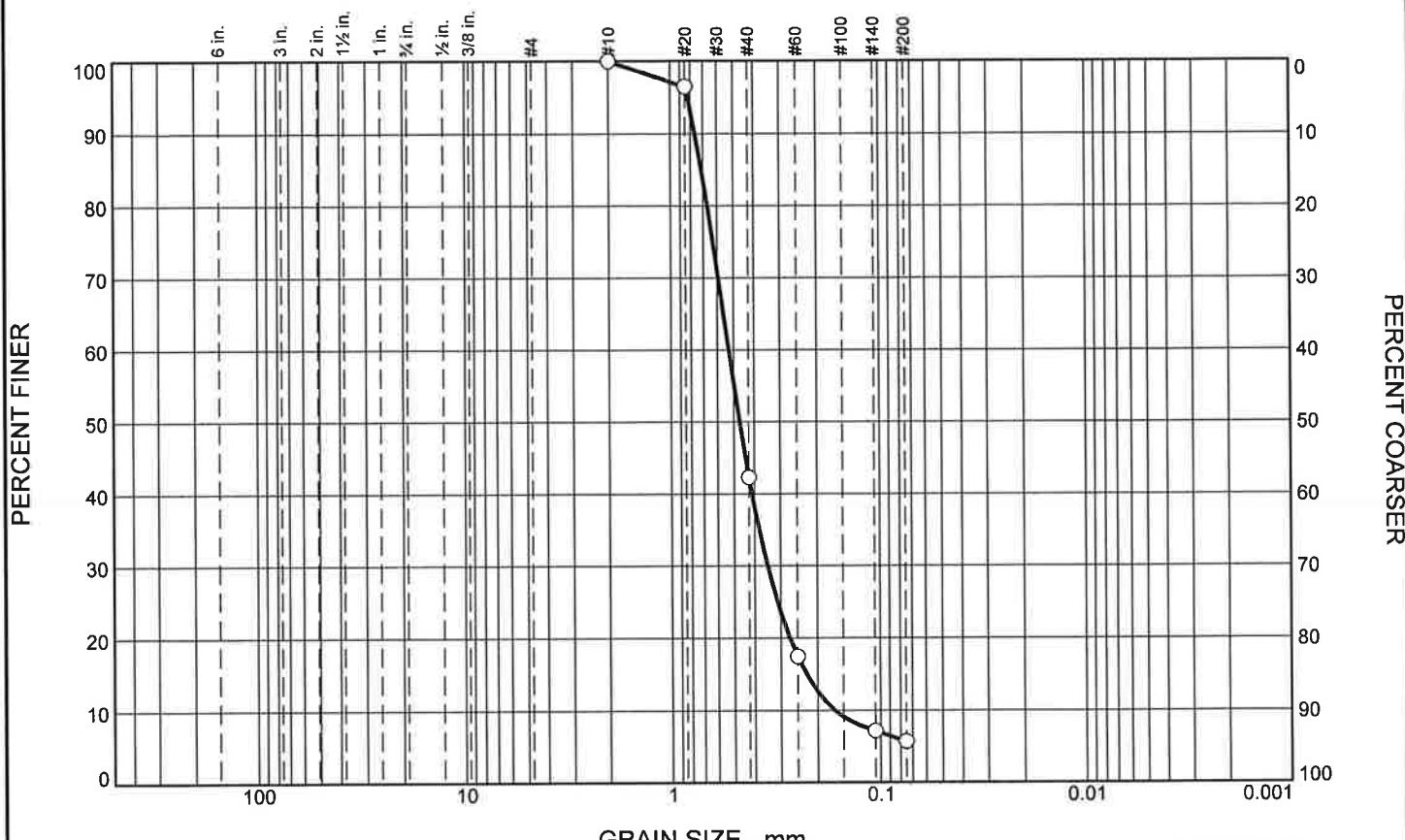
Source of Sample: S0033AR G-52763
Sample Number: U03

Depth: 7.5-10.0

Date: 11/30/13

	Client: URS/ARUP/HMM JV Project: California High Speed Train Project No: 2636-001.0	Figure
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Particle Size Distribution Report



SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100		
#20	96		
#40	42		
#60	17		
#140	7		
#200	6		

* (no specification provided)

Source of Sample: S0033AR G-52763
Sample Number: SS08

Depth: 23.5-24.0

Date: 11/15/13

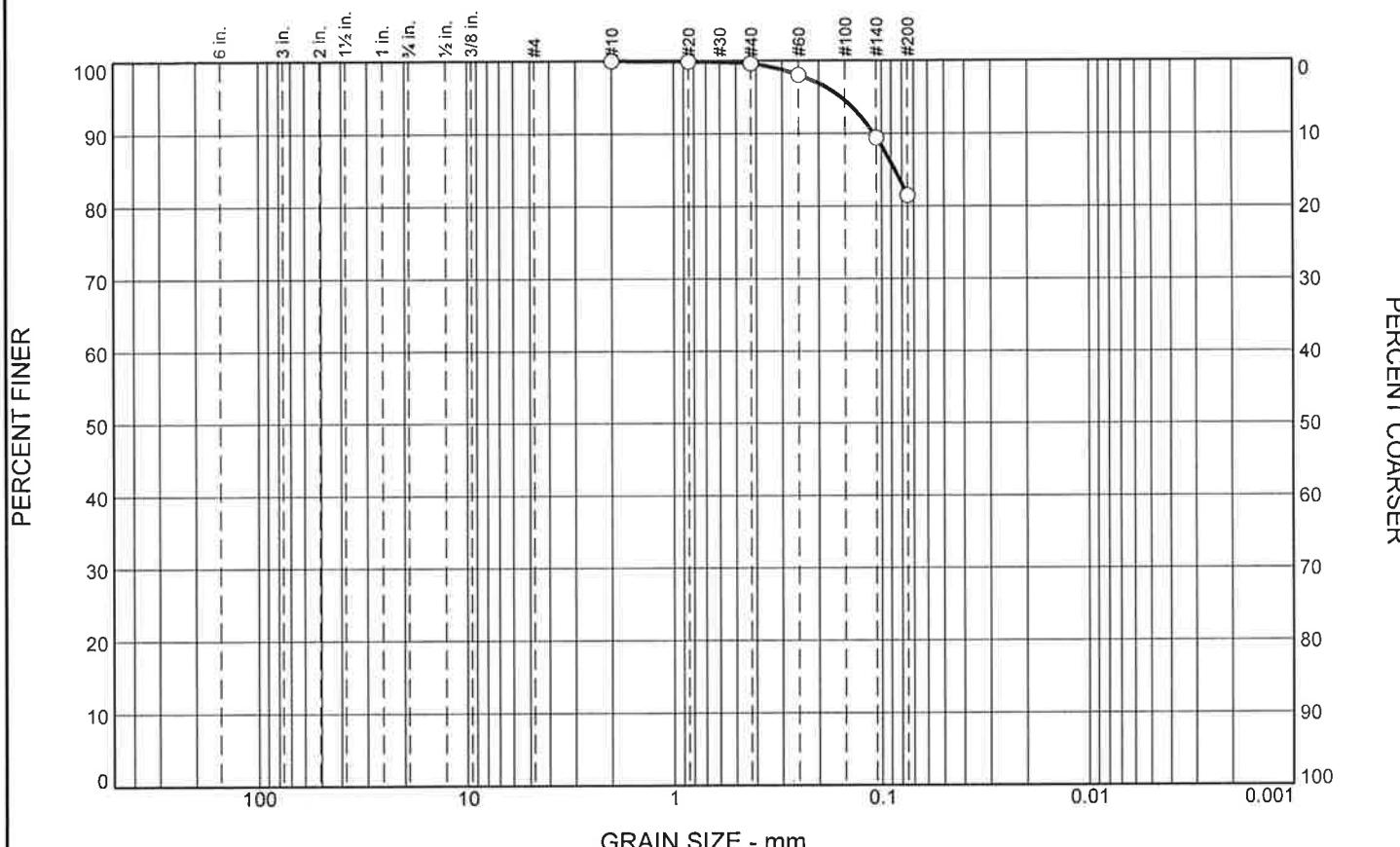
Client: URS/ARUP/HMM JV
Project: California High Speed Train
Project No: 2636-001.0

Figure

Tested By: JH

Checked By: PH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
	0	0	0	0	18	82	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100		
#20	100		
#40	100		
#60	98		
#140	89		
#200	82		

* (no specification provided)

Source of Sample: S0033AR G-52763
Sample Number: SS16

Depth: 50.0-51.5

Date: 1/15/14

Client: URS/ARUP/HMM JV
Project: California High-Speed Train

Project No: 2636-001.0

Figure

Tested By: JH

Checked By: PH



Construction Testing & Inspection * Geotechnical & Environmental Engineering

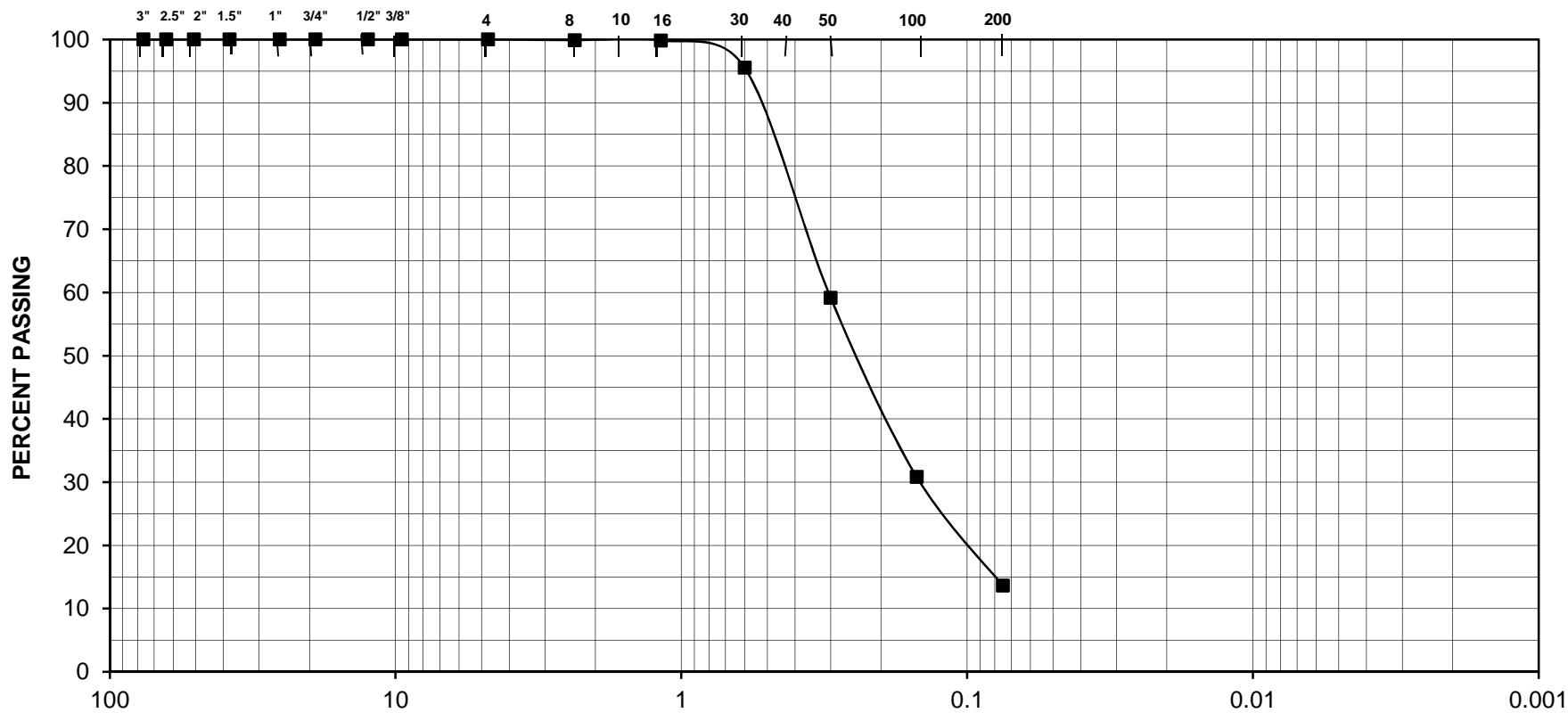
Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford		
TES#:	23502-ZS9	Date:	11/19/2013		
Boring #:	S0033AR; 56-56.5'	Sample No.:	MC17-1		
		Classification:	(SP) Fine Silty Sand		
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)		
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)		
Tare Weight		3/8"	2.0 (1.0)		
Total Dry Sample Wt.	179.4	1/2"	4.0 (2.0)		
Initial Weight Fine		3/4"	11.0 (5.0)		
Aggregate Before Wash	179.4	1"	22.0 (10.0)		
Final Weight Fine		1 1/2"	33.0 (15.0)		
Aggregate After Wash	158.4	2"	44.0 (20.0)		
Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.2	0.2	0.1	99.9	
#16	0.3	0.1	0.2	99.8	
#30	8.0	7.7	4.5	95.5	
#50	73.3	65.3	40.9	59.1	
#100	124.1	50.8	69.2	30.8	
#200	154.9	30.8	86.3	13.7	
Pan	158.4				



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

— MC17-1



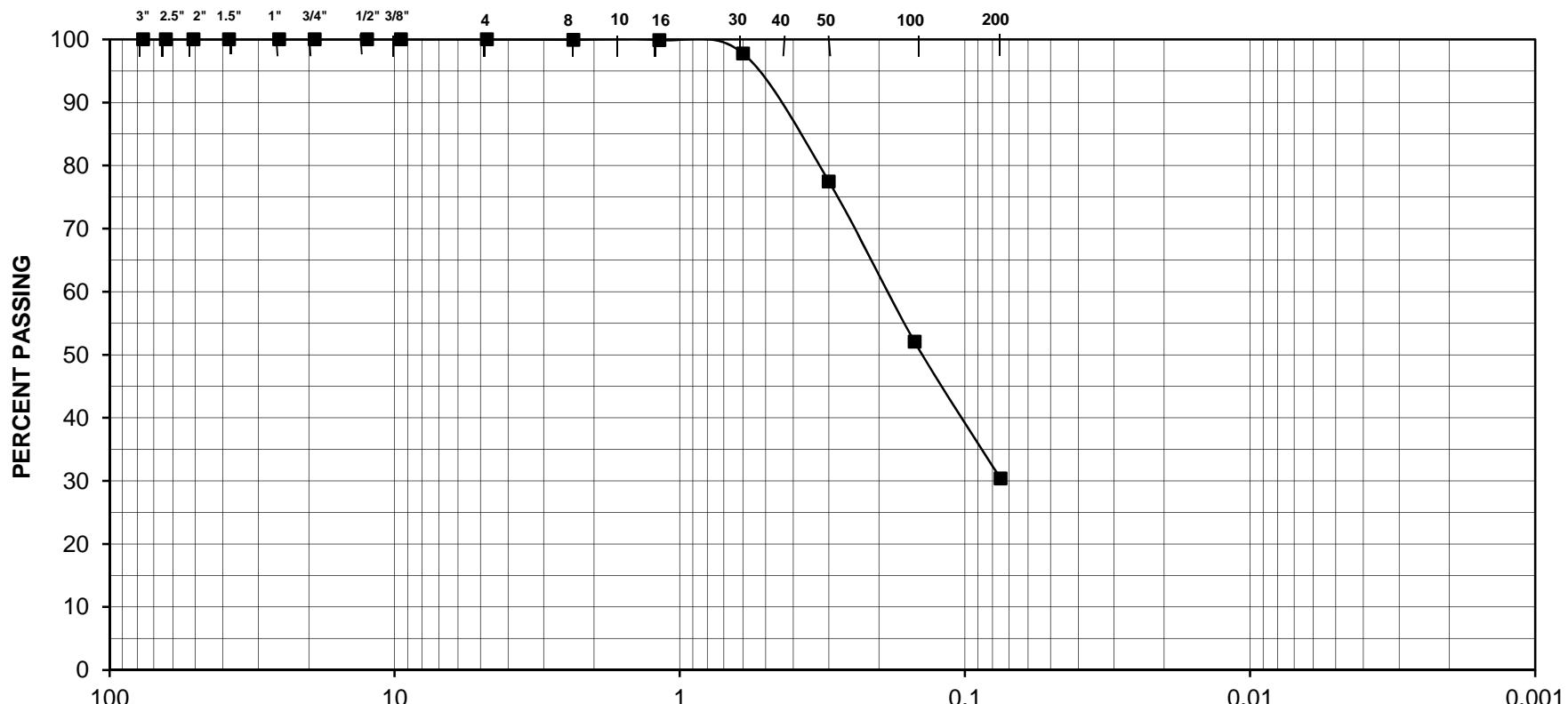
Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil / Fine Aggregate ASTM C-136

Project:	CA HSR	Technician:	K. Ford		
TES#:	23502-ZS9	Date:	11/19/2013		
Boring #:	S0033AR; 90.5-91'	Sample No.:	SS24		
		Classification:	(SM) Fine Silty Sand		
	Weight (lbs. or grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)		
Total Dry Sample + Tare Wt.		Sand	1.0 (0.5)		
Tare Weight		3/8"	2.0 (1.0)		
Total Dry Sample Wt.	179.0	1/2"	4.0 (2.0)		
Initial Weight Fine		3/4"	11.0 (5.0)		
Aggregate Before Wash	179	1"	22.0 (10.0)		
Final Weight Fine		1 1/2"	33.0 (15.0)		
Aggregate After Wash	131.2	2"	44.0 (20.0)		
Sieve Size	Cumulative Weight Retained	Individual Weights Retained	Cumulative % Retained	Cumulative % Passing	Specs.
3 in.			0.0	100.0	
2 1/2 in.			0.0	100.0	
2 in.			0.0	100.0	
1 1/2 in.			0.0	100.0	
1 in.			0.0	100.0	
3/4 in.			0.0	100.0	
1/2 in.			0.0	100.0	
3/8 in.			0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.1	0.1	0.1	99.9	
#16	0.2	0.1	0.1	99.9	
#30	4.0	3.8	2.2	97.8	
#50	40.3	36.3	22.5	77.5	
#100	85.8	45.5	47.9	52.1	
#200	124.6	38.8	69.6	30.4	
Pan	131.2				



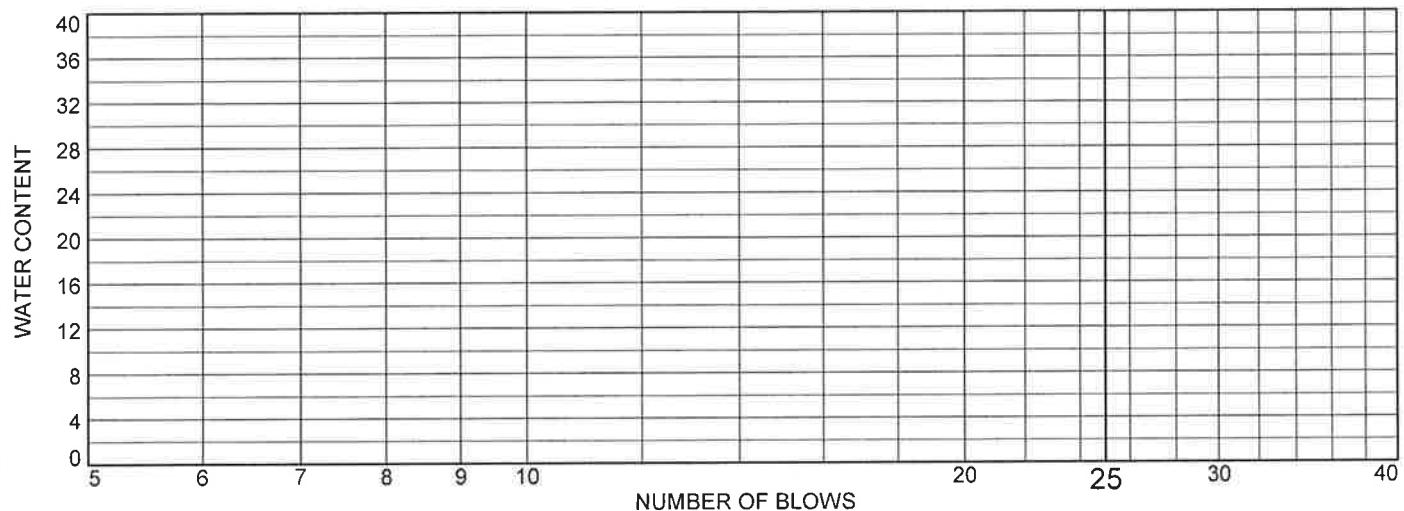
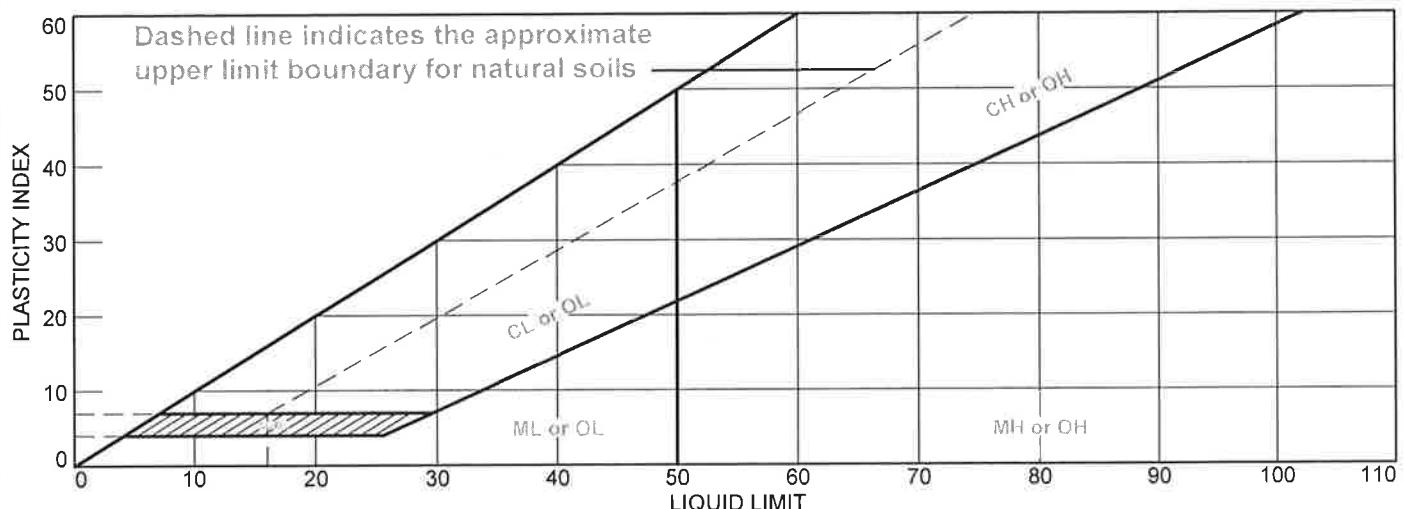
U.S. STANDARD SIEVE OPENING IN INCHES



GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

— SS24

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grayish brown silt with sand	NP	NP	NP	100	82	ML

Project No. 2636-001.0 Client: URS/ARUP/HMM JV

Remarks:

Project: California High Speed Train

● Source: S0033AR G-52763 Depth: 50.0-51.5 Sample No.: SS16



Figure

Tested By: JH

Checked By: PH

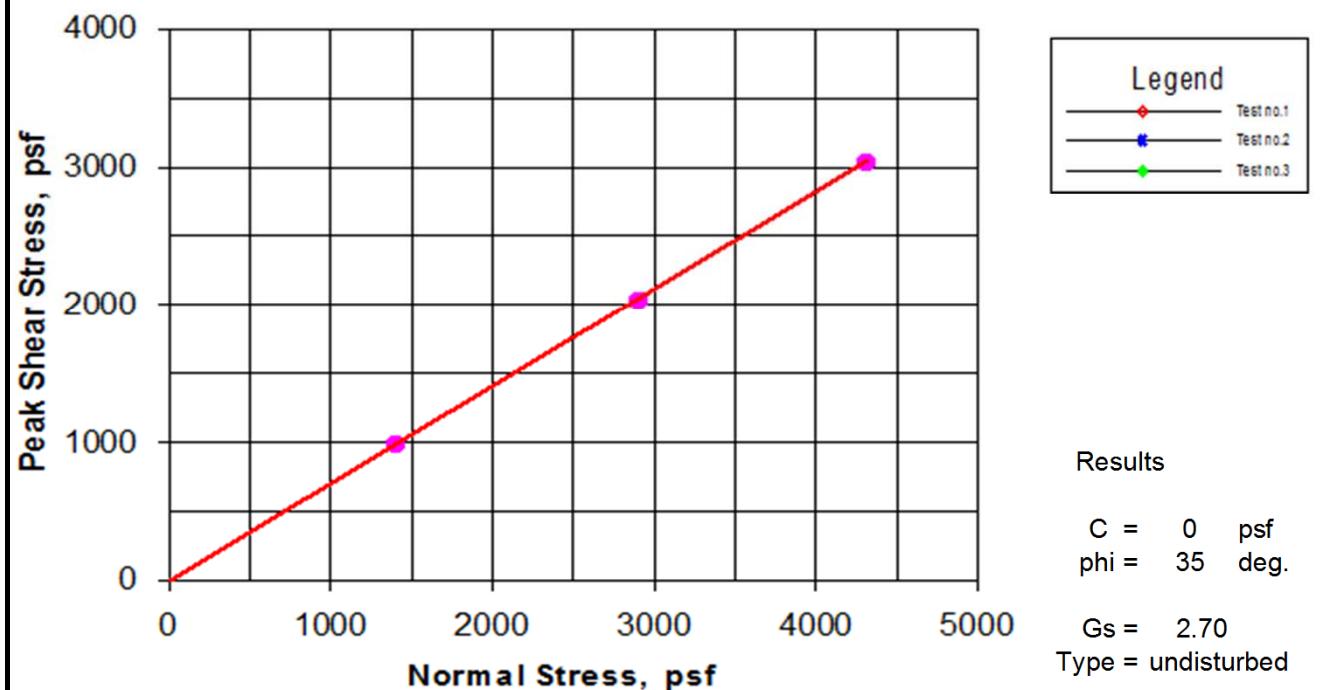
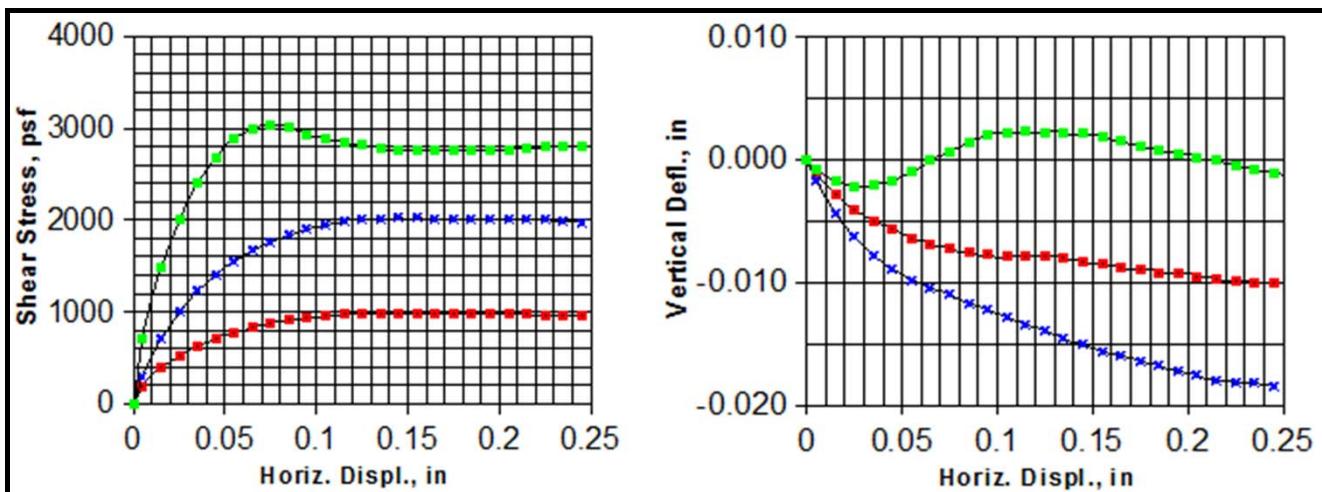
Direct Shear Moisture and Density Laboratory Results

wet density (pcf) = 129.0

dry density (pcf) = 110.5

moisture (%) = 16.8

Client: URS/ARUP/HMM JV	Boring #: S0033AR	Sample #: U03
Project: California High Speed Train	Depth (ft):	7.5-10
Project #: 2636-001.0	Soil: Grayish brown silty sand	
TEST REPORT:	Direct shear - inundated, consolidated, & drained test	



Test no.	SigN psf	Peak Shear str., psf	Displ. in.	Strain Rate in./hr	Initial MC %	Initial DD pcf	Initial Sat. %	Initial Void Ratio	Initial Ht. in.	Initial Dia. in.	Final MC %	Final DD pcf	Final Sat. %	Final Void Ratio	Final Ht. in.
1	1400	984	0.140	0.18	19.9	100.4	79	0.678	1.00	2.416	18.4	103.8	80	0.624	0.968
2	2900	2028	0.145	0.18	22.3	98.0	84	0.720	1.00	2.416	19.8	102.6	83	0.642	0.955
3	4300	3036	0.075	0.18	15.0	107.9	72	0.562	1.00	2.416	15.0	110.6	77	0.524	0.976

Client: **URS/ARUP/HMM JV** Boring #: **S0033AR** Sample #: **U03**

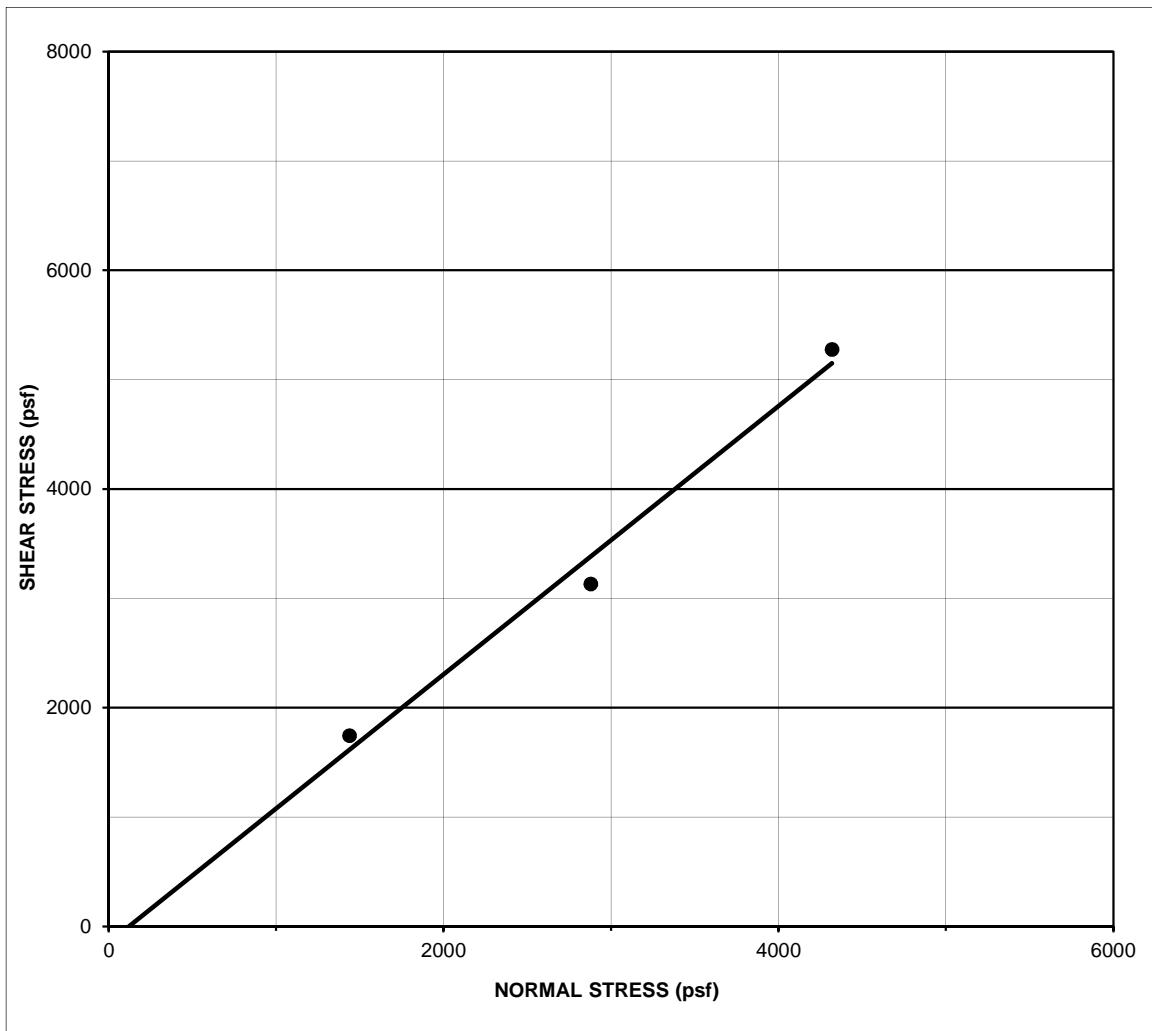
Project: **California High Speed Train** Depth (ft): **7.5-10**

Project #: **2636-001.0** Soil: **Grayish brown silty sand**

TEST REPORT: **Direct shear - inundated, consolidated, & drained test**



Direct Shear Test
ASTM D3080



PROJECT:	HSR
TES NO.:	23502-ZS9
SAMPLE DATE.:	10/30/2013
BORING NO.:	S0033AR
SAMPLE NO.:	MC04-1 Depth(11.5-12')
DESCRIPTION:	Fine Sand (SP)

Cohesive Pressure, psf	-150
Internal Friction Angle	51

SPECIMEN	A	B	C	D	E
DRY DENSITY (pcf)	95.3	95.3	95.3	---	---
INITIAL WATER CONTENT (%)	6.7	06.7	6.7	---	---
FINAL WATER CONTENT (%)	27.00	26.00	26.00	---	---
NORMAL STRESS (psf)	1440	2880	4320	---	---
NORMAL STRESS (psi)	10	20	30	---	---
MAXIMUM SHEAR (psf)	1744	3131	5275	---	---

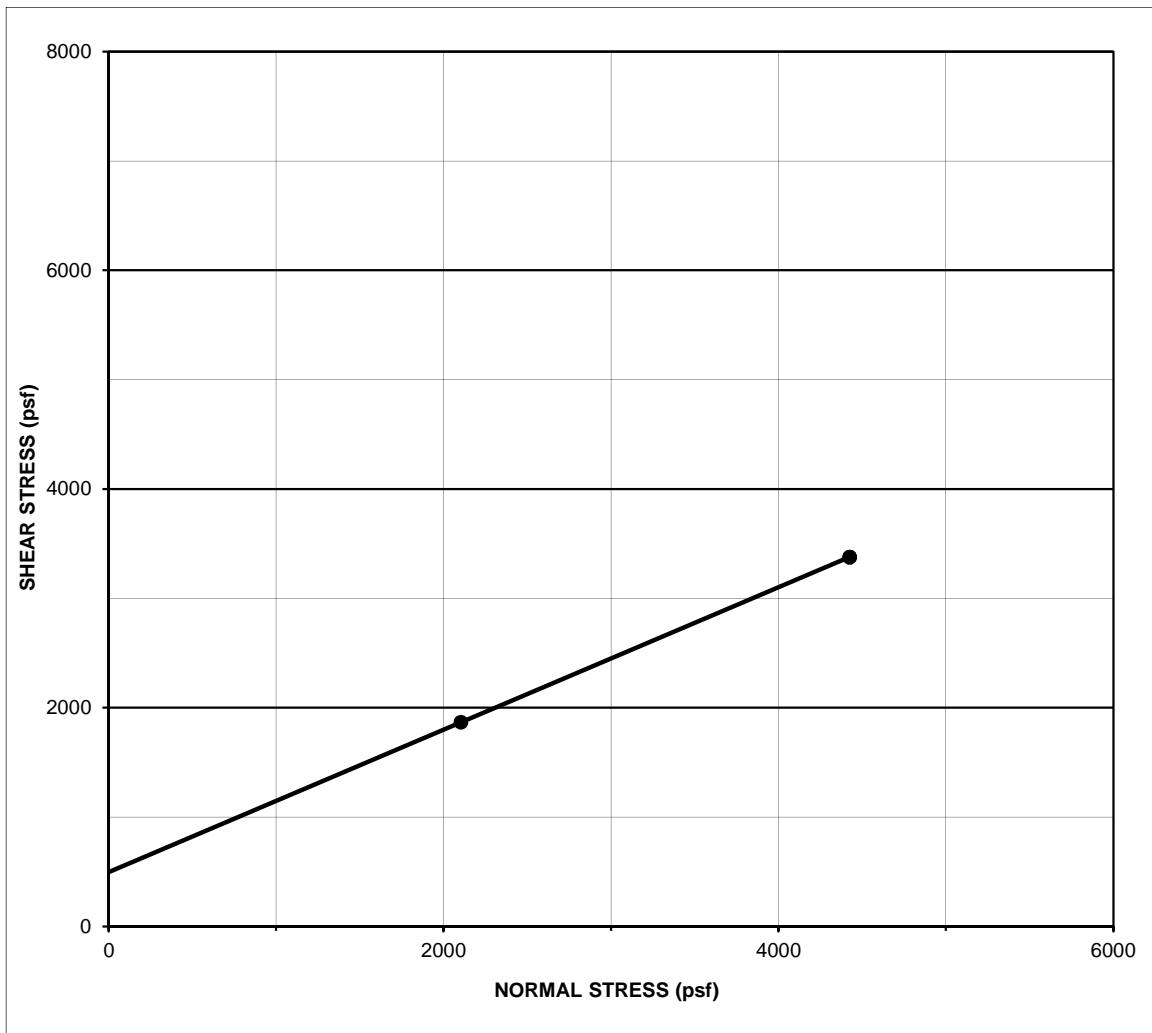
Engineering Materials Laboratory

4539 N. Brawley #108, Fresno, CA 93722

559-276-9311



Direct Shear Test
ASTM D3080



PROJECT:	HSR
TES NO.:	23502-ZS9
SAMPLE DATE.:	10/30/2013
BORING NO.:	S0033AR
SAMPLE NO.:	MC06-1 Depth(19-19.5')
DESCRIPTION:	Fine Sand (SP)

Cohesive Pressure, psf	490
Internal Friction Angle	33

SPECIMEN	A	B	C*	D	E
DRY DENSITY (pcf)	96.6	96.6	96.6	---	---
INITIAL WATER CONTENT (%)	17.6	17.6	17.6	---	---
FINAL WATER CONTENT (%)	24.00	27.00	27.00	---	---
NORMAL STRESS (psf)	2105	4426	4426	---	---
NORMAL STRESS (psi)	15	30	45	---	---
MAXIMUM SHEAR (psf)	1866	3378	3378	---	---

*3rd point disturbed and not run

Engineering Materials Laboratory

4539 N. Brawley #108, Fresno, CA 93722

559-276-9311

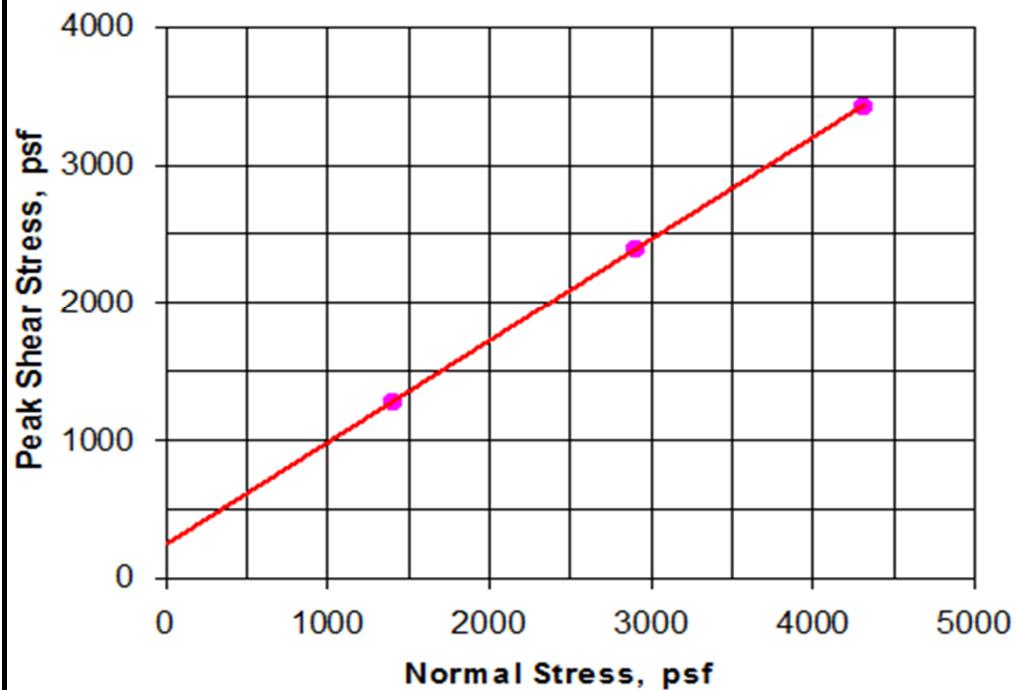
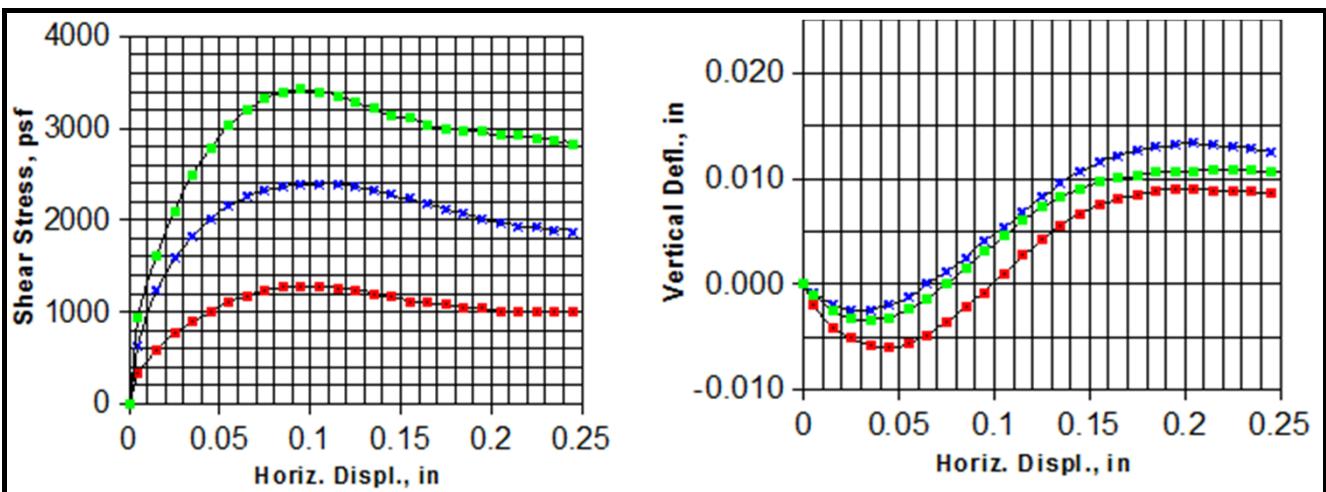
Direct Shear Moisture and Density Laboratory Results

wet density (pcf) = 106.0

dry density (pcf) = 102.5

moisture (%) = 3.4

Client: URS/ARUP/HMM JV	Boring #: S0033AR	Sample #: MC07-1
Project: California High Speed Train	Depth (ft):	21-21.5
Project #: 2636-001.0	Soil: Light grayish brown sand	
TEST REPORT:	Direct shear - inundated, consolidated, & drained test	



Legend

- Test no.1 (Red Diamond)
- Test no.2 (Blue Cross)
- Test no.3 (Green Diamond)

Results

$C = 250$ psf
 $\phi = 36$ deg.

$G_s = 2.70$
Type = undisturbed

Test no.	SigN psf	Peak Shear str., psf	Displ. in.	Strain Rate in./hr	Initial MC %	Initial DD pcf	Initial Sat. %	Initial Void Ratio	Initial Ht. in.	Initial Dia. in.	Final MC %	Final DD pcf	Final Sat. %	Final Void Ratio	Final Ht. in.
1	1400	1284	0.095	0.18	3.4	87.3	10	0.930	1.00	2.416	23.0	88.1	68	0.914	0.992
2	2900	2400	0.110	0.18	6.2	89.2	19	0.889	1.00	2.416	21.8	89.7	67	0.879	0.995
3	4300	3432	0.095	0.18	5.7	90.0	18	0.872	1.00	2.416	21.1	91.5	68	0.841	0.984

Client: URS/ARUP/HMM JV Boring #: S0033AR Sample #: MC07-1

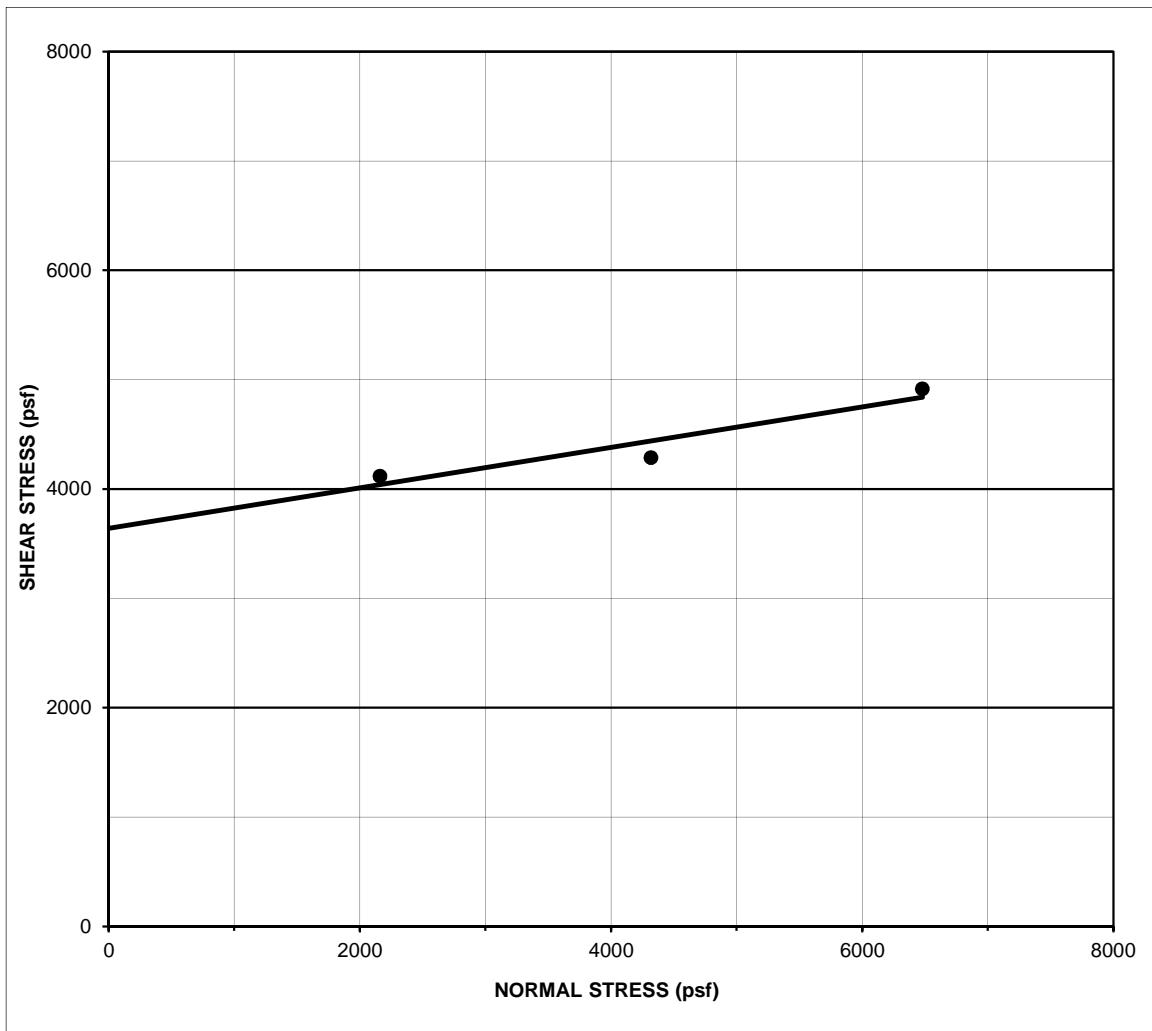
Project: California High Speed Train Depth (ft): 21-21.5

Project #: 2636-001.0 Soil: Light grayish brown sand

TEST REPORT: Direct shear - inundated, consolidated, & drained test



Direct Shear Test
ASTM D3080



PROJECT:	HSR
TES NO.:	23502-ZS9
SAMPLE DATE.:	10/30/2013
BORING NO.:	S0033AR
SAMPLE NO.:	MC10-1 Depth(18.5-19')
DESCRIPTION:	Fine Sand (SP)

Cohesive Pressure, psf	3640
Internal Friction Angle	10

SPECIMEN	A	B	C	D	E
DRY DENSITY (pcf)	107.8	107.8	107.8	---	---
INITIAL WATER CONTENT (%)	13.7	13.7	13.7	---	---
FINAL WATER CONTENT (%)	23.00	22.00	24.00	---	---
NORMAL STRESS (psf)	2160	4320	6480	---	---
NORMAL STRESS (psi)	15	30	45	---	---
MAXIMUM SHEAR (psf)	4117	4286	4915	---	---

Engineering Materials Laboratory

4539 N. Brawley #108, Fresno, CA 93722

559-276-9311

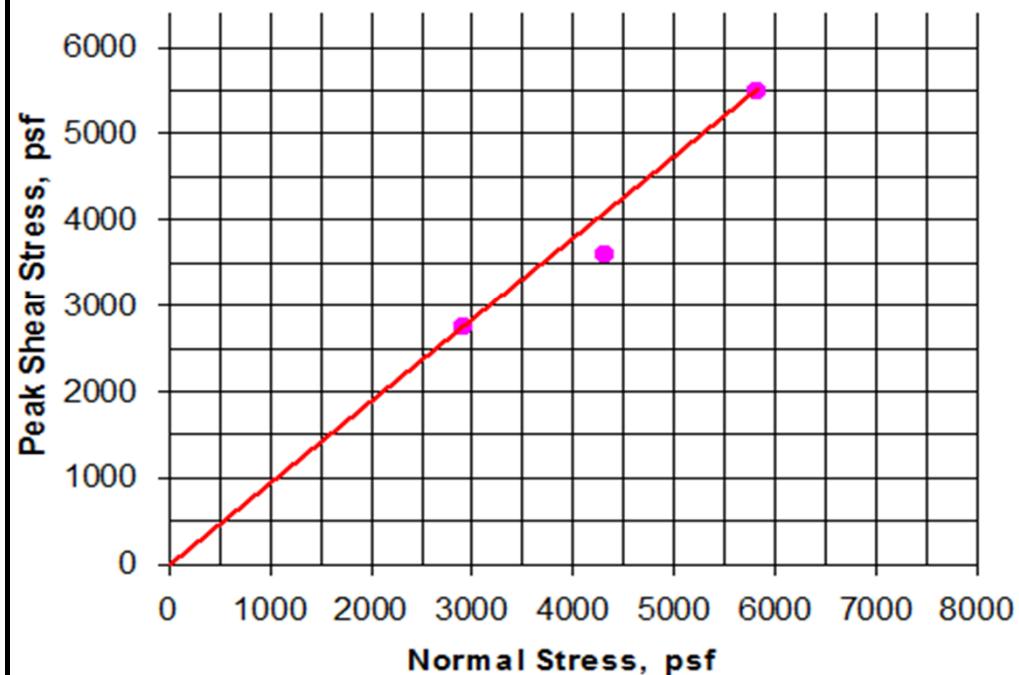
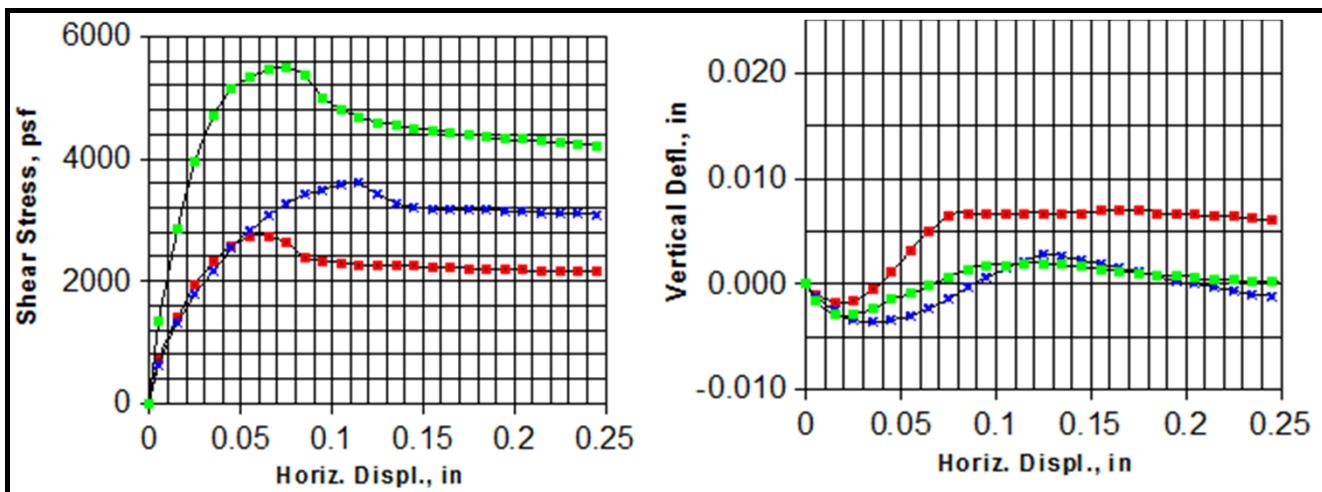
Direct Shear Moisture and Density Laboratory Results

wet density (pcf) = 127.6

dry density (pcf) = 112.7

moisture (%) = 13.2

Client: URS/ARUP/HMM JV	Boring #: S0033AR	Sample #: MC13-1
Project: California High Speed Train	Depth (ft):	36-36.5
Project #: 2636-001.0	Soil: Olive gray sandy silt	
TEST REPORT:	Direct shear - inundated, consolidated, & drained test	



Legend

- Test no.1
- Test no.2
- Test no.3

Results

$C = 0$ psf
 $\phi = 43$ deg.

$G_s = 2.70$
Type = undisturbed

Test no.	SigN psf	Peak Shear str., psf	Displ. in.	Strain Rate in./hr	Initial MC %	Initial DD pcf	Initial Sat. %	Initial Void Ratio	Initial Ht. in.	Initial Dia. in.	Final MC %	Final DD pcf	Final Sat. %	Final Void Ratio	Final Ht. in.
1	2900	2748	0.060	0.18	15.1	101.9	62	0.654	1.00	2.416	20.1	104.9	89	0.607	0.972
2	4300	3600	0.110	0.18	12.7	98.1	48	0.718	1.00	2.416	20.7	103.5	89	0.629	0.948
3	5800	5496	0.075	0.18	16.4	104.0	71	0.620	1.00	2.416	19.4	104.6	86	0.612	0.995

Client: URS/ARUP/HMM JV Boring #: S0033AR Sample #: MC13-1

Project: California High Speed Train Depth (ft): 36-36.5

Project #: 2636-001.0 Soil: Olive gray sandy silt

TEST REPORT: Direct shear - inundated, consolidated, & drained test

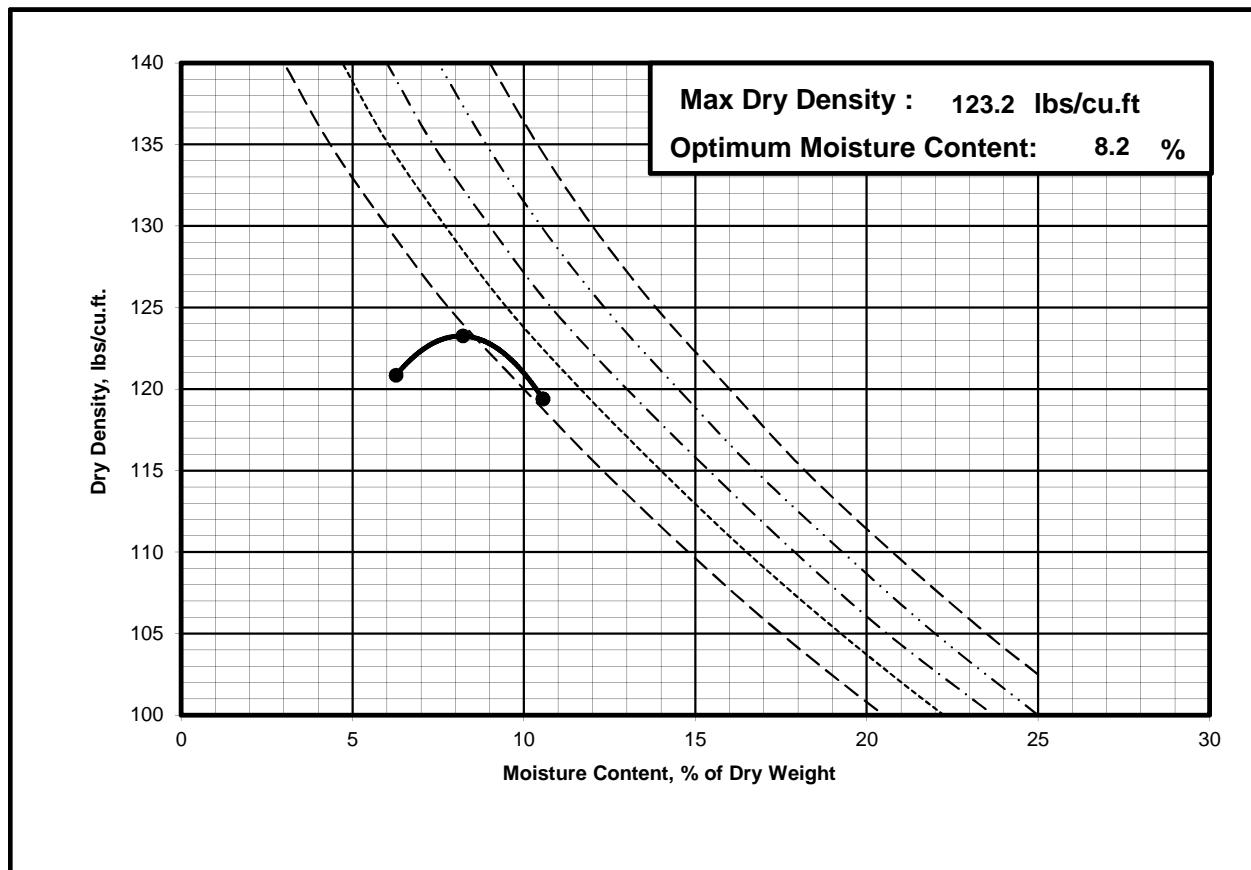


Laboratory Compaction Curve

ASTM D - 1557

Project Number : 23502-ZS9
 Project Name : HSR
 Date : 11/5/2013
 Sample location : S0033AR
 Sample/Curve Number : B01
 Soil Classification : SM
 Test Method : 1557A

	1	2	3	4
Weight of Moist Specimen & Mold, gm	3898.4	3973.4	3952.3	
Weight of Compaction Mold, gm	1958.6	1958.6	1958.6	
Weight of Moist Specimen, gm	1939.8	2014.8	1993.7	
Volume of mold, cu. ft.	0.0333	0.0333	0.0333	
Wet Density, lbs/cu.ft.	128.4	133.4	132.0	
Weight of Wet (Moisture) Sample, gm	200.0	200.0	200.0	
Weight of Dry (Moisture) Sample, gm	188.2	184.8	180.9	
Moisture Content, %	6.3	8.2	10.6	
Dry Density, lbs/cu.ft.	120.8	123.2	119.4	



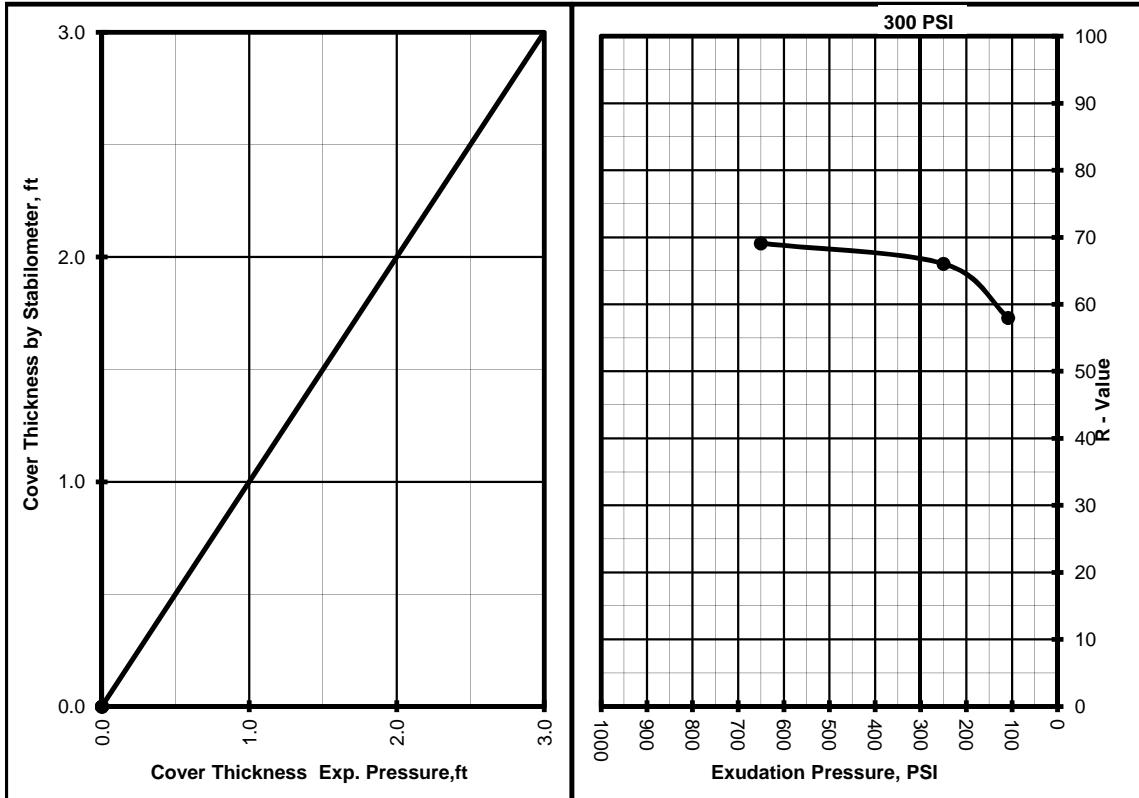


R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number : 23502-ZS9
Project Name : CA HSR FRE_BAK
Date : 11/1/13
Sample Location/Curve Number : Boring S0033AR,B-1 @ 0-5'
Soil Classification : SM

TEST	A	B	C
Percent Moisture @ Compaction, %	9.1	8.7	8.3
Dry Density, lbm/cu.ft.	120.4	119.8	122.1
Exudation Pressure, psi	108	250	650
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	58	66	69

R Value at 300 PSI Exudation Pressure	67
R Value by Expansion Pressure (TI =): 5	Expansion Pressure Nil



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MINIMUM RESISTIVITY; ASTM G57

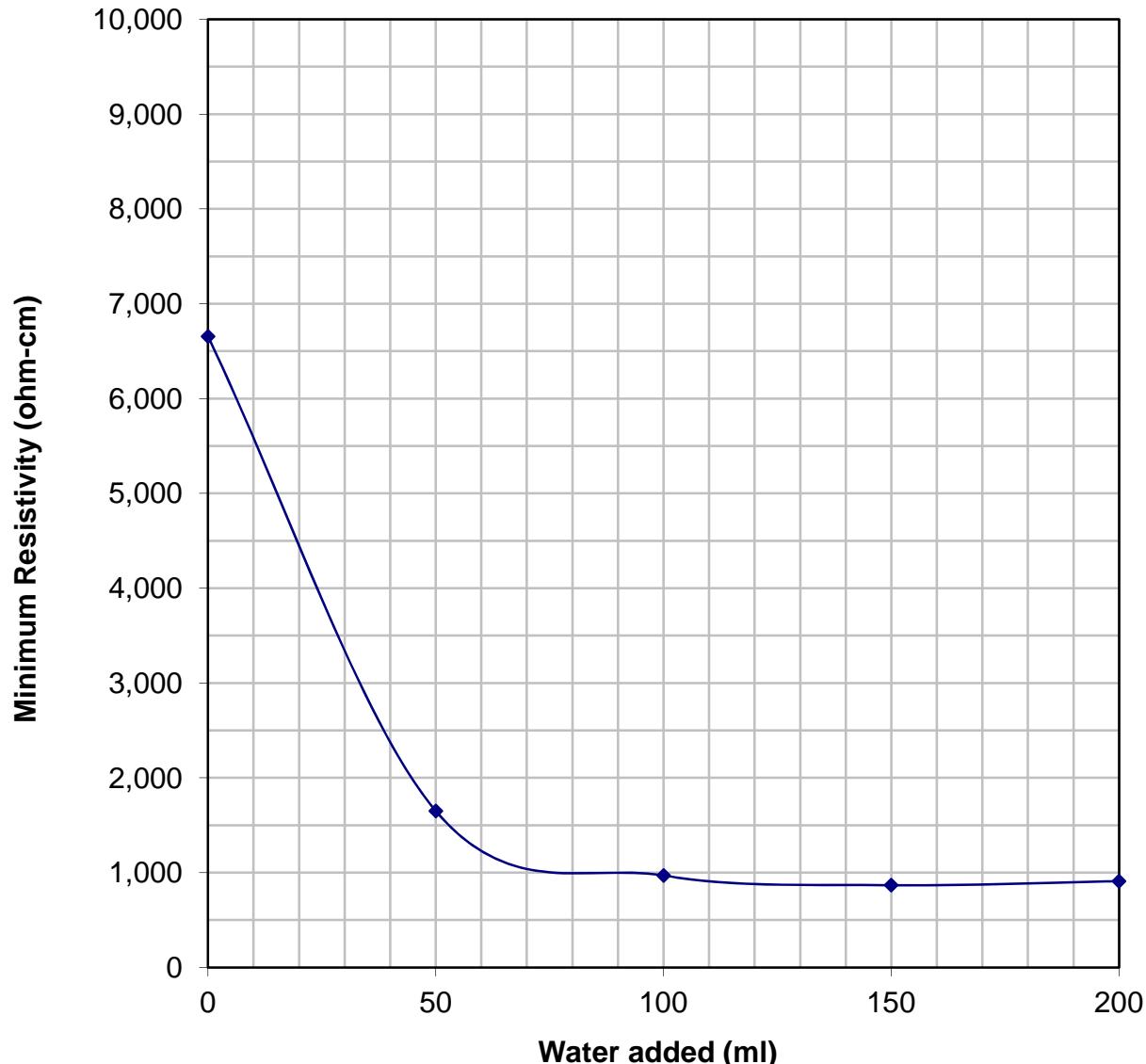
Project Name	CA HSR FRE_BAK	Sample Number	B01
Project Number	23502-ZS9	Sample Location	Boring S0033AR
Sample Date	10/25/2013	Material Description	SM
Sampled By	M. Walker		

Sample Condition	As Received	Minimum Resistivity					
		50	100	150	200		
Water Added (ml)	0	50	100	150	200		
Resistance (ohm)	6,250	1,550	910	815	855		
Resistivity (ohm-cm)	6,656	1,651	969	868	911	0	0

Minimum Resistivity (ohm-cm) 868 Field Resistivity (ohm-cm) _____

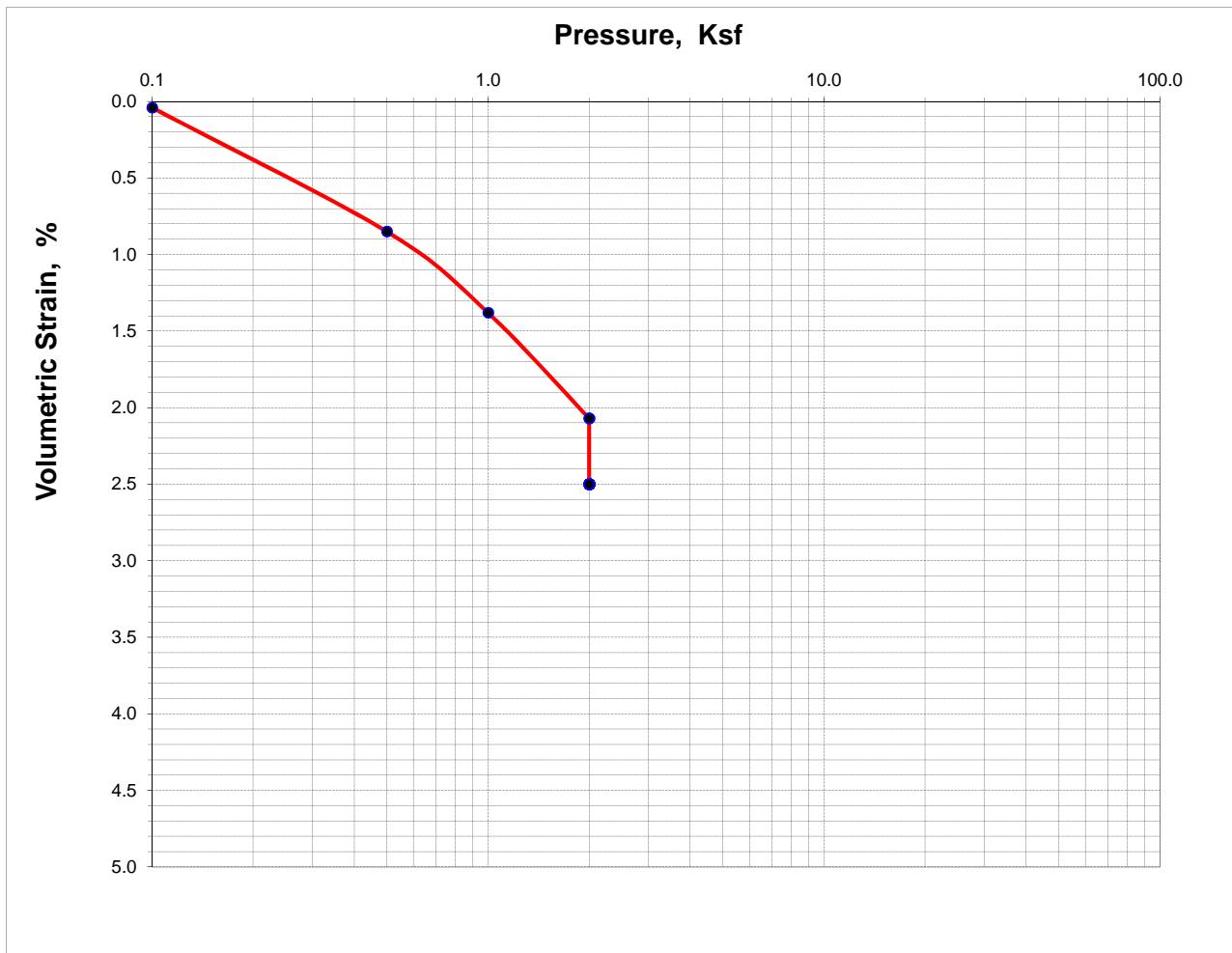
PH= 7.06 EC= _____

Box Constant= 1.065



COLLAPSE TEST

Boring Number	S0033AR	Sample Number	U03	Depth (ft)	7.5-10				
Soil Description	Grayish brown silty sand								
	Water Content, %	Dry Unit Weight, pcf	Void Ratio	Saturation %	Height in	Diameter in	Specific Gravity	Ic %	
Initial	14.6	108.0	0.561	70.3	1.00	2.420	(assumed)	2.70	
Final	15.8	110.8	0.522	81.6					





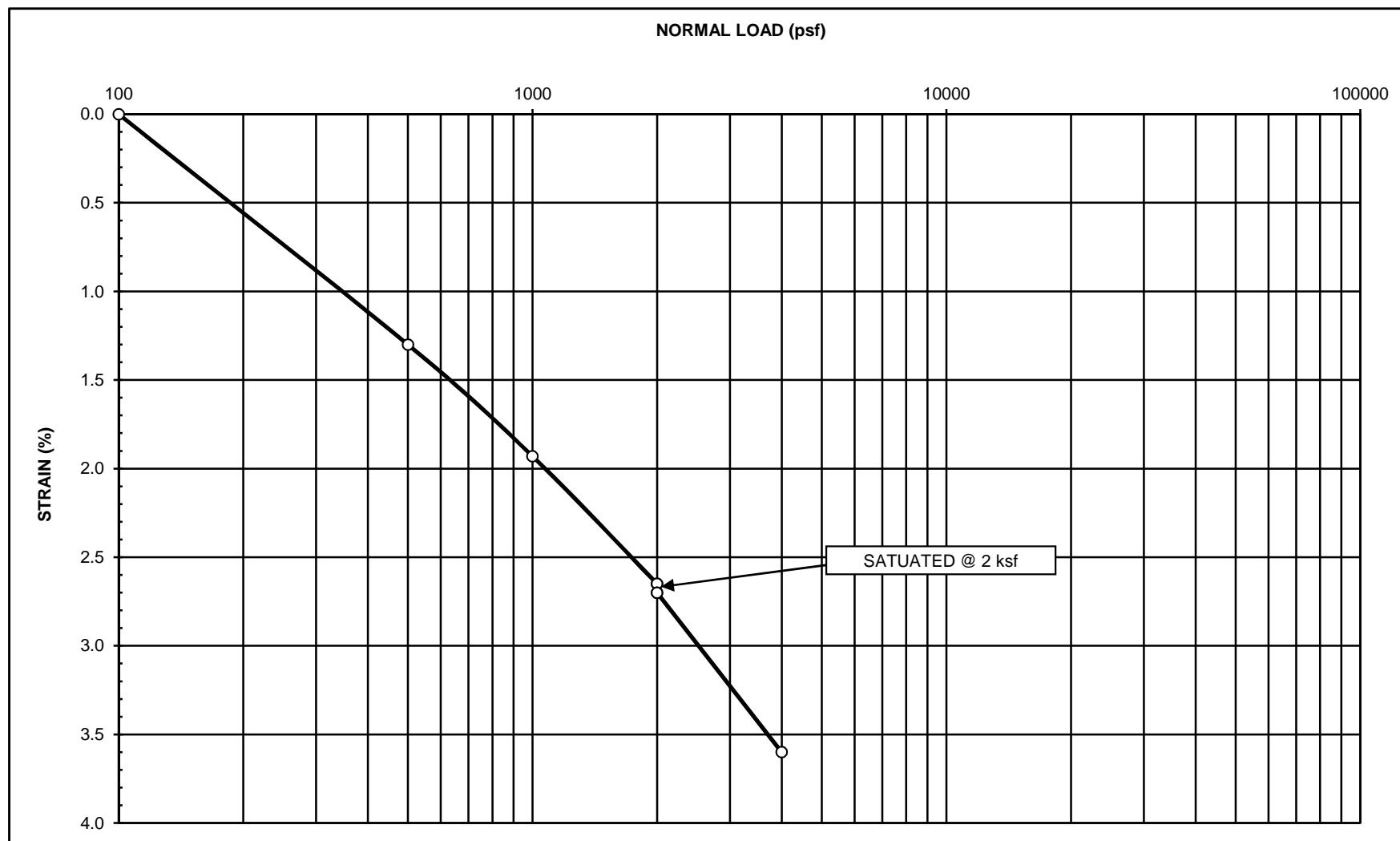
COLLAPSE POTENTIAL TEST DATA SUMMARY

PROJECT:	HSR	TEST #:	23502-ZS9
BORING #:	S0033AR	DEPTH (ft)	11.5-12.0'
SAMPLE #:	MC04-1	DATE:	11/19/2013
CLASSIFICATION:	(SP) Poorly Graded Sand	TESTED BY:	K. Ford
DIAMETER (in)	2.42	REMARKS:	Saturated @ 2 ksf.

	<u>INITIAL</u>	<u>FINAL</u>
THICKNESS (in)	<u>1.0000</u>	0.9640
VOLUME (cc)		
GROSS WET	<u>168.7</u>	185.2
GROSS DRY		161.9
TARE	43.5	43.5
WATER		23.3
SOIL		118.4
MOISTURE CONTENT (%)	<u>14.6</u>	19.7
WET DENSITY (pcf)	103.7	121.7
DRY DENSITY (pcf)	90.5	93.9



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COLLAPSE POTENTIAL TEST DATA



BORING NO.	DEPTH (ft)	SAMPLE DESCRIPTION	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PROJECT: HSR
					PROJECT NO.: 23502-ZS9
S0033AR	11.5-12.0'	MC04-1 (SP) Poorly Graded Sand	14.6	90.5	TEST DATE: 11/19/2013
			FINAL	FINAL	TESTED BY: K. Ford
			19.7	93.9	CONDITION: Undisturbed



COLLAPSE POTENTIAL TEST DATA SUMMARY

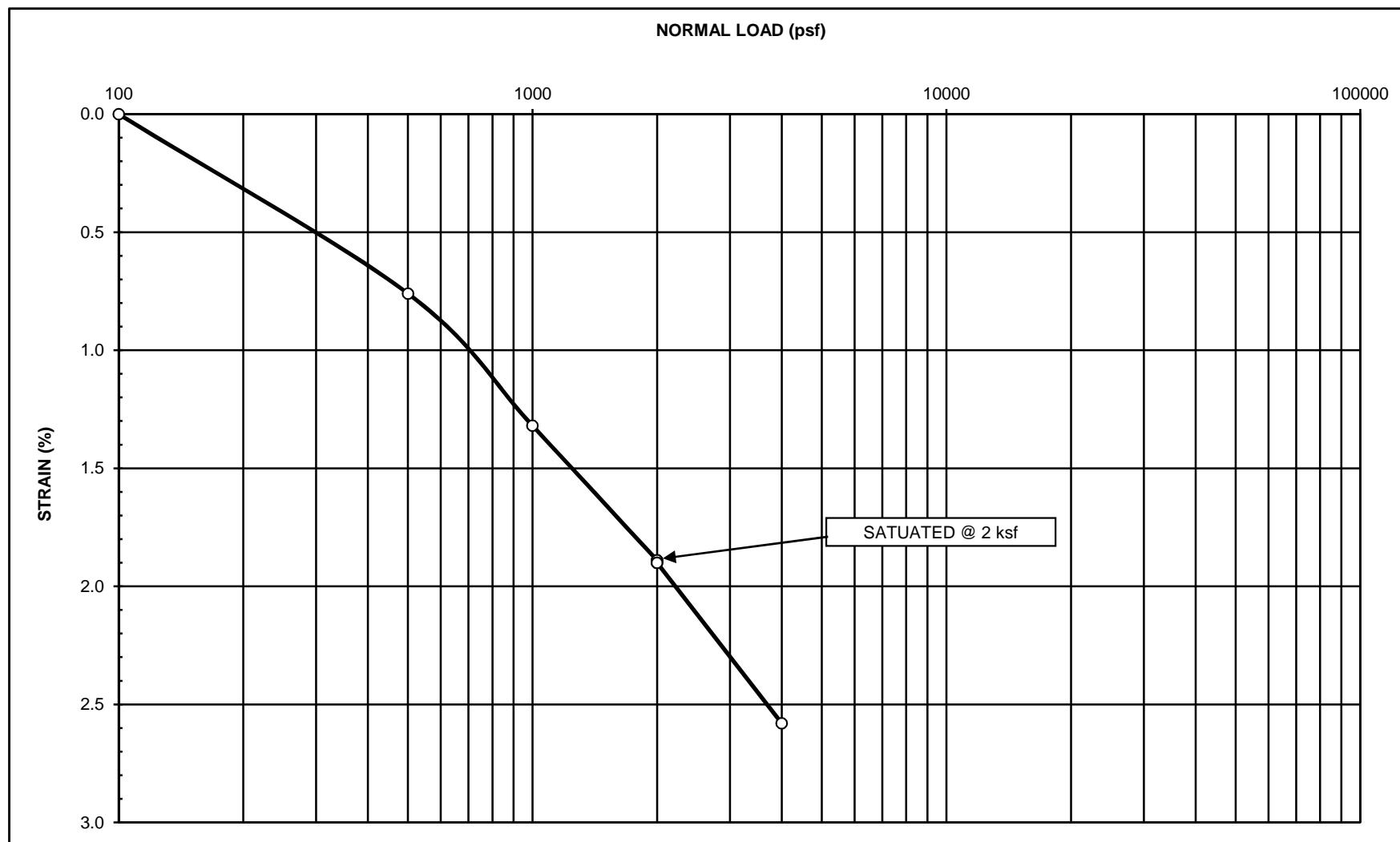
PROJECT: HSR
BORING #: S0033AR DEPTH (ft) 19.0-19.5'
SAMPLE #: MC06-1
CLASSIFICATION: (SP) Poorly Graded Sand
DIAMETER (in) 2.42

TES #: 23502-ZS9
DATE: 11/19/2013
TESTED BY: K. Ford
REMARKS: Saturated @ 2 ksf.

	<u>INITIAL</u>	<u>FINAL</u>
THICKNESS (in)	<u>1.0000</u>	0.9742
VOLUME (cc)		
GROSS WET	<u>184.7</u>	<u>185.5</u>
GROSS DRY		<u>161.4</u>
TARE	<u>44.8</u>	<u>44.8</u>
WATER		<u>24.1</u>
SOIL		<u>116.6</u>
WATER CONTENT (%)	<u>14.6</u>	<u>20.7</u>
NET DENSITY (pcf)	<u>115.9</u>	<u>119.6</u>
DRY DENSITY (pcf)	<u>101.1</u>	<u>103.8</u>



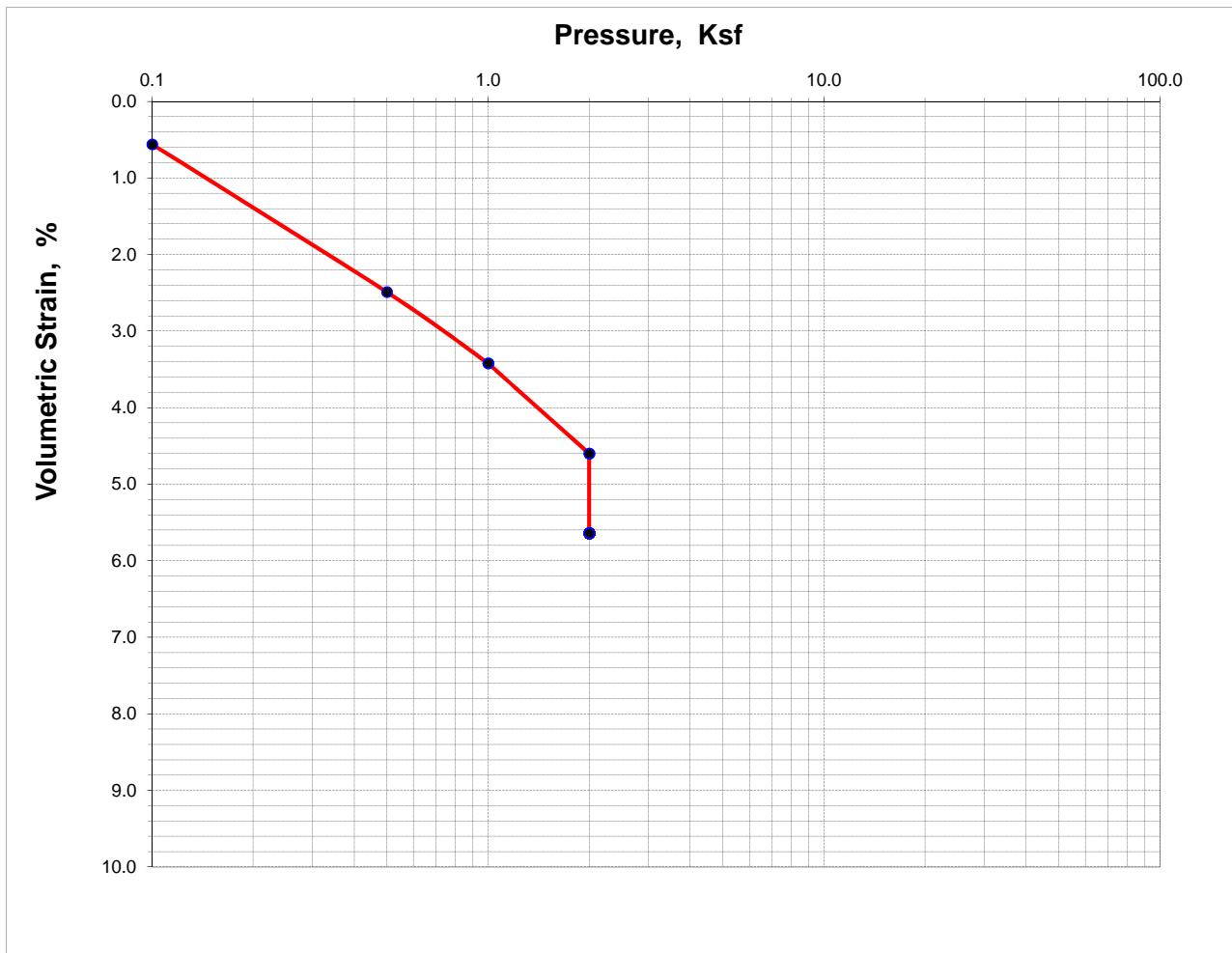
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COLLAPSE POTENTIAL TEST DATA



BORING NO.	DEPTH (ft)	SAMPLE DESCRIPTION	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PROJECT: HSR
			CONTENT (%)	DRY DENSITY (pcf)	PROJECT NO.: 23502-ZS9
S0033AR	19.0-19.5'	MC06-1 (SP) Poorly Graded Sand	14.6	101.1	TEST DATE: 11/19/2013
			FINAL	FINAL	TESTED BY: K. Ford
			20.7	103.8	CONDITION: Undisturbed

COLLAPSE TEST

Boring Number	S0033AR	Sample Number	MC07-1	Depth (ft)	21.0-21.5				
Soil Description	Light grayish brown sand								
	Water Content, %	Dry Unit Weight, pcf	Void Ratio	Saturation %	Height in	Diameter in	Specific Gravity	Ic %	
Initial	5.0	89.9	0.876	15.3	1.00				
Final	22.8	95.3	0.770	79.9		2.420	(assumed) 2.70		



Chemical Analysis

SO₄ - Modified Caltrans 417 & CL - Modified Caltrans 417/422

SEG Project Number : 1-513-0002
TES Project Number : 23502-ZS9
Date : 11/08/13
Sample Location : S0033AR: B01
Soil Classification :

Sample Number	Soluble	Soluble		
	Sulfate	Chloride	Cl	
S0033AR: B01	150	mg/Kg	960	mg/Kg
S0033AR: B01	160	mg/Kg	970	mg/Kg
S0033AR: B01	150	mg/Kg	960	mg/Kg
Average	153	mg/Kg	963	mg/Kg